THE SCOPE

September 1938

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THE SCOPE

Published by the students of the Massachusetts School of Optometry

Boston, Massachusetts

Less than ½c a day

Statistics indicate than an average of less than $1.50 a year is spent by the general public on glasses and if factories succeed in creating popularity for zylonite frames, unbreakable lenses and mountings that prevent lens breakage, this small amount will be still further reduced.

Statistics also indicate that many people are buying two daily newspapers at a cost of four cents a day — (less than ½ cent a day for glasses; 4 cents a day for newspapers).

Let us hope that the day is not far distant when optometrists and opticians may expect to receive at least five cents a day, average, for their priceless professional services. To be able to read and to work better; to play and to enjoy life more — isn't this worth more than the price of two newspapers?

We hope, reader, that the above thoughts agree with yours.

●

Day after Day

In visiting professional establishments we have noted fewer "examinations" even though our hosts appeared busy. Lens breakage did help increase incomes for optometrists and opticians.

GEM OPTICAL COMPANY

333 WASHINGTON STREET
BOSTON, MASSACHUSETTS
"The House Without a Retail Store"

"The breakage of lenses often creates a possibility for examinations."

THE SCOPE

Presents

"THE PROBLEM OF PROGRESSIVE MYOPIA"

by Ralph H. Green, O. D., D. O. S.

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Massachusetts School of Optometry
Boston, Massachusetts

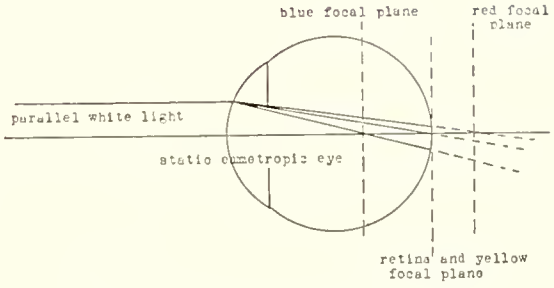
1. Introduction

It is impossible and of little importance to include all the theories that have been advanced to account for the etiology of myopia. Some are purely hypothetical and result out of efforts on the part of armchair theorists. These are not based on anatomical, physical, or clinical facts. Other investigators have been altogether too hasty in arriving at decisions on the basis of a few successful cases. Most of this group have failed to present all the clinical data, making it impossible to analyze and arrive at conclusions, while others have presented theories which have not been duplicated by others using similar methods of treatment. As a result, I shall adhere to those theories that, in my opinion, have, at least, some basis for acceptance; and will attempt to present them as clearly as I know how, presenting also, where possible, the data that makes full acceptance of these theories impossible.

2. Definition of Emmetropia

It is that condition of refraction in which there is a perfect relationship between the refracting system of the eye and the position of the plane corresponding to the position of the rod and cone cells (tips) in the retina. The additional qualifications are:

1. The yellow focal plane must occupy the aforementioned position. (Figure 1).



Illustrating the chroatic aberration of the human eye. Average span 1.80 diopters.

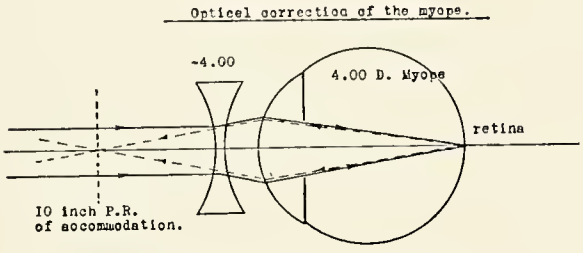
Figure 1

2. The accommodation must be static. this is the more or less ideal state of refraction which is seldom attained and which cannot practically exist for a number of reasons which we cannot attack at this time.

Applying the foregoing to myopia, we may state that it is that condition in which there is a faulty relationship between the refracting system and the position of the retina. The retina is too far removed for the dioptric value of the optical system. The size of the eyeball (antero-posterior diameter) does not determine the type of refractive error. Any axial length of the eyeball may be emmetropic provided the refracting system is adjusted properly.

The lens necessary to correct this myopia is a minus or a negative lens having a negative focal length equal in value to the positive far

point of accommodation in the static eye. (Lens effectivity, for the sake of simplicity, will be disregarded). Figure 2.



P.R. of acc. of a myope is positive.
Focal point of a minus lens is negative.

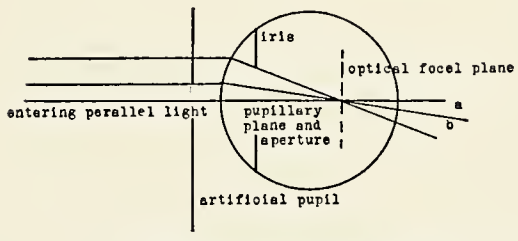
Figure 2

The term myopia, itself, is derived from the Greek, and means "close-eye". The name describes the external appearance of such individuals that are myopic. The reason for these individuals acquiring this abnormal lid position is, primarily, for the reduction in size of the retinal blur circles, thereby increasing or improving their vision. The general rule to remember is the reduction of vision varies directly with the size of the blur circles. (Figure 3.) The second reason is that myopes, when high in degree, suffer from photophobia. This photophobia is due to:

1. Rather large pupils in the myope.
2. Destruction of retinal pigment cells.
3. The normal amount of pigment is thinly distributed over larger than normal retinal areas.

Since the discussion is to be limited to the problem of progressive myopia, we will omit such material on myopia as is not directly associated with our problem.

Figure 3



The resultant effect of reducing the size of the pupil on the size of the retinal blur patch.
a-blur patch with smaller pupil
b-blur patch for larger pupil

3. Definition of Progressive Myopia

Progressive myopia is that condition in which after subsequent examinations there is an increase in the degree of the apparent measure of myopia. However, as it is assumed that all myopes at some time or other must have been progressive, this term is reserved for those conditions of myopia where:

1. The visual acuity is normal after optical correction.
2. It reaches a stationary point at maturity.
3. There have been no noticeable organic changes.
4. It usually makes its first appearance at about the age of ten.
5. This type can sometimes be checked by the various methods of treatment at the disposal of both medical and non-medical practitioner.

Progressive myopia must be further differentiated from the true progressive myope which is of much more serious nature. The true progressive myope displays the following characteristics:

1. The myopia progresses after maturity is reached.
2. It resists all form of treatment at our disposal.
3. This form of myopia makes itself felt at an early age.
4. There are noticeable organic changes.
5. The degree of myopia is usually greater than six diopters and may reach as high a twenty or thirty diopters.
6. Vision can seldom be restored to normal.

4. Discussion of the Proposed Theories for the Etiology of Myopia

The following theories will be presented:

a. Mechanical theory.

b. Endocrine theory.

c. Hereditary theory.

a. THE MECHANICAL THEORY is the oldest, most popular and most generally and widely accepted theory today. In general, it is believed that close work is responsible for the production of myopia, and the various factors associated with this, which are held responsible are as follows:

1. Accommodation.

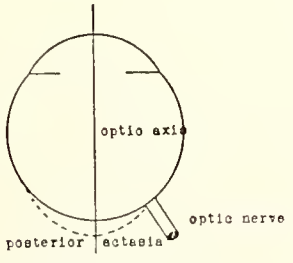
2. Convergence.

3. The Optic Nerve.

(1) ACCOMMODATION: Those who believe that accommodation is responsible for the production of myopia hold that the convexing of the lens results in an increase in the intra-ocular pressure, which, if the sclera has less than normal resistance, will cause it to yield to the increase in pressure. However, that accommodation is probably not responsible can be demonstrated as follows:

a. As the intra-ocular pressure is increased, why does not the eyeball give way in that region which represents its weakest point, that is, in the center of the optic disc at the lamina cribosa? When the intra-ocular pressure is increased, as in a glaucomatous condition, the lamina cribosa gives way as is evidenced by the Ophthalmoscopic appearance of the optic disc. (Figure 5.)

Figure 6



Schematic illustration of the shape of the typically high myopic eyeball.

b. Careful measurement of the intra-ocular pressure in myopes has never revealed any increase in intra-ocular tension.

c. The vast majority of people (70 per cent to 80 per cent) are hyperopic, compensating for their structural hyperopia by accommodating. Yet, in spite of the constant use of accommodation, the eye remains hyperopic and only relatively few become myopic.

d. If the myopia remains uncorrected, less accommodation is needed in close work. In fact, when the myopia reaches three or more diopters, the accommodation is not active for the near focusing. Yet, in spite of the inactivity of accommodation the myopia progresses.

SUMMARY

Thus, we see that if accommodation is responsible for the production of myopia, the method whereby this is accomplished is not clear, and sufficient evidence has been presented to prove that accommodation itself cannot be held responsible for the etiology of myopia. It is possible that the use of accommodation may play a role in the etiology of myopia, but just how it does so is not yet clear and it may be possible, further, that accommodation may play a secondary role and only become effective when the eye is predisposed to other factors.

Soon it was realized that the increase in intra-ocular pressure cannot explain the causation of myopia, and as a result, another theory was proposed, suggesting that accommodation is injurious not so much from the increase in ocular pressure as from traction which is exerted upon the choroid with subsequent inflammatory changes followed by atrophy and thinning of the choroid and sclera. This hypothesis has as its basis, experiments which demonstrate a forward movement of the choroid during contraction of the ciliary muscle (positive accommodation). This as-

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LENS MEASUREMENT THROUGH THE AGES

Printed through the courtesy of the American Optical Company

Suppose we start with Alhazen, an Arabian mathematician of the 11th century, who has been called the "pioneer in the science of optics." We know little or nothing about him beyond the fact that he had an exceptionally brilliant mind which, at times, was inclined toward fantasy. For instance, in a moment of imagination he boasted he could construct a machine for regulating the inundations of the Nile.

Very shortly he was probably cursing his too fluent tongue, for the caliph Hakim summoned him to Egypt to put his idea into practice. Knowing his scheme was impractical, and fearing the caliph's anger, he feigned madness until Hakim died.

According to available information it was Alhazen, however, who first noticed that light became bent under certain circumstances, and who investigated somewhat the subject of lenses, or pieces of glass fashioned in such a way as to bend the light where he wanted it to go. He later wrote a book on the refraction of light, the structure of the eye, and the philosophy of vision which proved of value to investigators hundreds of years later.

And next we come to Roger Bacon, often called the "Father of Science," who lived in the thirteenth century. Let's visit him for just a second in the prison where he spent so many years of his life because of his alleged dealing in black magic.

Instead of mourning his hard lot, Bacon is hard at work on his scientific problems, for nothing matters to him except science. Possibly these are some of his rambling thoughts: "What causes the rainbow, most beautiful of heavenly visions . . . Food spoils in the outside world, but in this cold vault what little they give me remains fresh a long time. I'm convinced it's heat which spoils food, but is it a physical or chemical action? . . . If I were successful in converting iron into gold how popular I'd be with the King, and how unhappy, for that's all he'd permit me to do . . . Bending of light . . . I should like to experiment more with glass . . . Why won't they give it to me?"

It was Roger Bacon who first described convex and concave lenses, but there is no definite proof that he ever made eyeglasses out of these lenses.

Venice was long the chief source of glass for optical use, and it is there we shall go for a minute to visit the optical shop of Giovanni who flourished the last half of the fifteenth century.

It is a lovely spring night. Giovanni, at peace with the world, is sitting in the balcony of his little marble home fronting the Grand Canal, idly watching an occasional gondola smoothly gliding by. Overhead, a mellow moon is beneficently smiling down at Giovanni and the golden waters of the Canal.

Tired after a hard day in his shop, Giovanni's mind is still considering the technical problems of the day. He sighs. What wouldn't he give to have a more accurate method of measuring lenses, but, alas! he is only an able artisan—not a scientist, capable of calculating and devising breath-taking discoveries. Still, it is something to be able to fashion the best lenses in all of Venice.

A large and elaborately carved gondola, surrounded by smaller craft, suddenly floats into Giovanni's consciousness. Mildly interested, he watches the flotilla. It must be some magnifico of Venice, perhaps even one of the Medicis, those patrons of the arts, who were doing so much to make their native land famous throughout the world.

At a signal, the flotilla stops, and a powerful voice bellows forth, "Is this the home of Giovanni, the spectacle maker?"

Leaping to his feet, Giovanni bows and stammers forth: "Yes, sire. What can I do for you?"

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OPTOMETRICAL OPPORTUNITY

by C. A. Wood

"Better Light; Better Sight" is the motto of a large concern which deals in electric lamps and various types of lighting appliances. The truth of the motto has been brought forcibly home to us here in New England by the recent disastrous storms coupled with flood conditions in various sections. The necessary reversion to candles and oil lamps as sources of light make us realize how much we really depend upon the modern electric lamp in our every-day seeing.

The inadequacy of the substitute light sources is quite apparent to the student who attempts to study under conditions of reduced illumination. The picture of Abraham Lincoln reading by the flickering light of his fire may be a fine one for the historian to contemplate; but force the same historian to read under the same conditions and the picture loses some of its rosy hue.

It is not sufficient to assume, however, that all types of electric lighting are adequate. A tragic picture indeed is that of the home where people are trying to read or study by the dim glow of a 25 watt bulb where a 60 or a 75 watt lamp would more nearly approximate the necessary amount of illumination. The factor of glare also enters into home lighting. It is truly surprising how little progress has been made in educating the general public as to the harmful effects of direct, intense illumination.

In consideration of the above facts it is obvious that a wide field is open to the optometrist in the prevention of ocular difficulties through the use of proper lighting. Some progress has been made on the part of certain commercial companies, where trained investigators canvass individual homes, testing lighting equipment and recommending certain improvements. However, the actual work done along these lines is small compared to that which should be accomplished. The optometrist is in a key position to render real public service along these lines and should not fail to take advantage of this position.

The student of optometry is especially situated to be of service. The trend toward specialization within the profession becomes more apparent each day. With the whole field of optometry spread out before him the student would do well to consider the specialization possibilities to be found in the realm of prevention of ocular difficulties through proper illumination.

FRATERNITY NEWS

by Paul Bouchard

At the closing meeting of the twenty-fifth year of Pi Omicron Sigma, the following members were elected officers for the ensuing year:

Grand Chancellor — Dr. Ralph Green
Chancellor — Porter Dexter
Vice Chancellor — Paul Bouchard
Secretary — John Weast
Treasurer — Winston Clark
Sergeant at Arms — Harvey Rosenthal

The Fraternity has much in store for all members this year, and we begin on the 30th of September with the Pi Omicron Sigma smoker. The Initiation and Entertainment committees are now making plans for the smoker, and they promise to make it an affair that will never be forgotten.

Our first social event will be the Annual "Shin Kick" and Halloween Poverty Dance to be held on the 28th of October at YE OLD LANTERNE INN. Everyone is invited, the price of admission being, as usual, one (1) cent per pound for the young lady, and additional costs for members of the fraternity and pledgees not dressed in old clothes; so let's get together fellows, and make this a real big time.

Don't forget that you have a date on October 28th at YE OLD LANTERNE INN.

THRU THE EDITOR'S EYES

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EDITORIAL

This issue of the SCOPE marks the eleventh consecutive year of existence of the only undergraduate publication at M. S. O. There have been, according to the records, other magazines and papers published by the student body, but, to our knowledge at least, none which have fared so far and so well.

The first SCOPE, originated, by the way, by our Dr. Green and Dr. Bernard Fritz, came into being in the year 1928, and since then has appeared more or less regularly every month. During this period the magazine has gained slowly but steadily in its appeal and usefulness, as each year's staff took it upon themselves to add their bit to it; and it is with this thought in mind, and the fervent hope that the publication will leave their hands with all its good points and just a little something added, that the staff for 1938-39 wind up their work on the first issue.

We hope you can find it in your hearts to overlook our faults and forgive the mistakes which are bound to happen now and then. Remember, it is *your* magazine, and in order to reflect the spirit of the student body must have your fullest cooperation.

And so — our pens are somewhat shakily laid aside, and we wait with bated breath as the presses start rolling, relentlessly, inexorably engraving our puny efforts on the sands of Time, "for all the world to see and criticize."

BROUGHT TO A FOCUS

This column, a new addition to the SCOPE family, is more or less of an experiment, as probably every column has been at one time or another.

The object: To bring a great deal of optometric and associated material, which at the present time is inaccessible to the student, within his easy reach; a sort of digest of references, as it were, with every student at M. S. O. a self-appointed proof reader.

The method: We all know, and particularly the members of the Senior class, what an immense amount of material there is to wade through to get at the essential facts that we must have. In order to make this easier, the next time *you* run across an article that you feel has helped solve one of your perplexing problems, jot down the name of the book or magazine and the topic discussed and drop it in the SCOPE box the next time you happen by. In this way the amount of information available to each man at school will be increased some two hundred times.

The accomplishment: Just for example, suppose I had a sudden overwhelming desire (maybe with a State Board just around the corner) to find out something about the effect on the eyes of some of the common diseases, and was sort of uncertain as to just where to find it. Wouldn't I be decidedly grateful and quite relieved upon opening the latest issue of the SCOPE to find this:

Eye Conditions Produced by Common Diseases.

American Journal of Optometry vol. 14, No. 5 p. 162. — EDITOR

SENIOR SLANTS

by Leslie G. Wright

So we're back — same time, same place, same sections, but with the added distinction of the title SENIOR A and B. None of the old gang seem to be missing, and we of the B group can even boast of a new personality, the mysterious Mr. Young.

There's one thing though, that seems to have divided this group of faces into two distinct divisions; namely the relative epithelial solar discoloration (sunburn to you). The vacationers look like Tahitian beachcombers, while others of us are sporting a typical working man's pallor. Be that as it may, investigation into the goings on of our classmates during the vacation period has brought to light some mighty interesting facts. Here are some of the highlights:

President Tom seems to have grabbed off the most glamorous spot, that of hot trumpet man in a real dance orchestra. (The Stonhouse Stenopaic Swingsters, no doubt.)

Old Doc Wood served as a camp doctor for the season, and, in between poison ivy treatments, managed to sneak in over one hundred and fifty complete ophthalmoscopic examinations. I'll bet the poor kids were bleary-eyed for weeks.

Class clown Rinn sawed, pounded and chiseled (??) his way through a profitable summer as carpenter's apprentice. They must have run him ragged too, for as yet none of his classic remarks have shattered the peace and quiet of our Optometry classes.

To George Wilde go honors for the most versatile employment. His activities ranged from pouring sodas and short-order cooking, to mixing "horses' necks" at the Horse Neck Beach Bar.

Irving Wecker chauffered; Stephenson, they tell me, turned volunteer fireman; and Woolf polished up his professional technique selling shoes.

The most practical man is Carl Labdon, who is actually a registered barber, and a darn good one, too. In addition to making a good living he seems to have found the best possible use for unoccupied ophthalmic chairs and old M. S. O. clinic coats.

Unluckiest was Salerno, who spent a good part of his time in a hospital. Overwork, claims Tony, but we who have seen his Big Apple antics, are a bit suspicious that the Shag or Lambeth Walk finally got him.

Gene Davis at least seems to have come down to earth. Lots of earth if his working in the U. S. Department of Agriculture means anything.

After this it may surprise you to know that some of the crew actually worked along optometric lines. Drs. Peterson and Myers worked for one of the larger optical companies in Boston. Johnny Hathaway got to be a sub branch-manager down in New Bedford for a couple of weeks, and Art March was all over the lot.

Fred Ziegler was with an optometrist in Fitchburg and Amelia Rodd spent her third season as assistant to a local optometrist.

Nice going gang — and I wonder how we'll all be doing next summer?

A Thought In Passing

Do not depend too much on genius. Many of the tales we hear about the genius of Lincoln, Edison, and others, when analyzed, dwindle down to the ability to work hard. These men — all of them — labored long into the night and diligently throughout the daylight hours — mastering the problems that stood between the crude mechanisms and utilities of their time and the comforts, luxury, and conveniences of today.

SOPH SOAP

by Herbert S. Greenblatt

It was with a feeling of genuine pleasure and delighted anticipation that your correspondent walked up that good ol' iron staircase (and nearly fell, as usual). After the long, hot summer the prospects of renewing all the friendships contracted the previous year and digging into the interesting work which came our way the end of the last term seemed very attractive. After all, — we're now Sophomores, and incidentally, the first Soph class ever to grace these premises, so the year to come should hold promise and interest for all of us. So much for the future; the past is too rich with news to discard.

The past summer saw the following join the great masses struggling to earn enough money to buy what they desire. Most of us made just about enough to pay for a year's subscription to the SCOPE.

Gil Hindman helped Mr. Swift sell his various meat products. (The big ham!)

Vic Savin held women's feet — in a shoe store.

Bill Correnti was a tout at 'Gansett. Give us a tip, Bill. (We've got him marked as a nag.)

Norman Mayer helped his "pop" in a local department store — by staying home!

"All things come to him who waits". There is a quotation that runs something

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AMONG THE GIRLS

by Amelia E. Rodd

It seems good to get back to school and to see all our school-mates again. We find only four Sorority members left, Ruth Masse, Eleanor Lynch, Madelyn Dyer, and yours truly. However we have three prospective members, Evelyn Adler and Janet Mechanic of the Freshman Class, and Elsa Schroder of the Sophomore Class. Elsie is giving some of us a chance to brush up on El Espanol. No esta, senorita?

We have a budding romance in our midst, between our quietest young lady and a very well known, used-to-be student. It has gotten to the stage of correspondence. Better not say too much to your friends in the future, noisiest (according to Dr. Svendesn) young lady.

We also know of another romance, but that, we believe, has long passed the letter-writing stage.

Did you all here the siren in Dr. Namias' class the other day? Well, we believe that Eleanor Lynch was being hunted for. In case you don't know, Marlboro is under martial law, and Eleanor forgot to get her leave-of-absence.

There is an ancient saying: "Don't put your nose where it doesn't belong" To get full information about the man who had his nose sliced off during the storm by doing just what he was told not to do, see Eleanor Lynch. (Incidentally about 32 stitches were required to put it back on again.)

We have heard from some of our former Sorority members:—

Marion Donovan, whom we find is employed at a local wholesale optical establishment.

Doris Cournoyer, who is working for an optometrist in Southbridge.

More news next month.

WELCOME FRESHMEN

On behalf of the students of both the Senior and Sophomore classes the members of the SCOPE staff extend the hearty handclasp of friendship and welcome to the incoming class.

We, who are already somewhat acquainted with the profession which you have chosen, congratulate you on the foresight and intelligence which has led you to seek a career in Optometry. New as we yet are to the field, there is not one of the upperclassmen who cannot state with a convincing earnestness that there is more to learn in our work, more research to be done, and more benefit to be conferred on your fellow-man than could possibly be encompassed in many men's lives. Rest assured that you cannot have too much to give Optometry, and remember too that she is a just mistress who promises no more in return than you are willing to give.

Now, to get on a little less pedagogic basis, a more concrete evidence of our welcome will be tendered you in the form of the annual Freshman Smoker. The date of this event has not definitely been set, but is expected to be sometime in the early part of October. Don't miss this chance to become acquainted with the real fellows behind that professional aloofness which cloaks the members of the faculty and many of the upperclassmen during school hours.

One of the first things you must learn is to subdue your more boisterous feelings; and such demonstrations of good fellowship as backslapping etc., definitely have no place in a professional clinic. Remember that sometime soon your own patients will appear in that same clinic. Look at it through their eyes and your conduct will be irreproachable.

You must realize that you are part of an institution which you undoubtedly wish to be proud of, and *you* are the ones who can make it or break it. Keep this thought always in mind. M. S. O. can mean as much or as little to you as you wish. Make it worth while.

SPORT - O - SCOPE

by Ralph Fritz

The opening of the school year once more finds the M. S. O. basketball team coming out to conquer new fields. May we take this opportunity to welcome the class of "42", at the start of their career, and wish them success as they also venture into new fields, hoping for victory.

First call for candidates came Monday, September 19, when manager Harvey Rosenthal enlightened the squad as to the prospects of the team during the "38-39" season. Looking over last year's record, we find that in winning 7 out of their 8 games, the team scored 341 points over their opponents, including the Harvard Dental freshmen, and Salem Teachers College, J.V. By all indications, the team this year should make M. S. O. history, by scoring over 500 points.

The schedule, as this is written, is incomplete, but a basketball game, dance, and splash party is planned for January 11, at the Y.M.C.A. Don't put your swim-suits in the moth balls until then. Last year's game and dance at the Burroughs Newsboy's Foundation proved very popular.

To help defray the expenses of the team for the coming year, a raffle was held, with the lucky winner being awarded $5.00, in cash.

-- LENS MEASUREMENT

(continued from page six)

"You can let me in your shop, for one thing. The rest depends on you."

Cautiously opening the door of his shop, Giovanni looks out into the large gondola only a few feet distant. At the sight of his white face the fashionably dressed occupants burst into roars of laughter.

The same rich voice roars again: "Be not alarmed, man. We come only for spectacles, not your life. But they must be good spectacles, else . . . " He draws his fingers across his throat suggestively, and then laughs again at the badly frightened Giovanni.

"Lorenzo," a mild voice says, "have done with your jesting. We have little time."

The voice becomes respectful. "Yes, grandfather."

Bowing and scraping, Giovanni ushers his guests into his shop and hurriedly pulls out chairs for them. The older man sinks into a deep chair and peers about the room.

"I am Signor Cosimo dei Medici," he announces abruptly, "and this is Lorenzo, my grandson, who, some day, will succeed to my power. Here, of late, my eyes have troubled me . . . I cannot see as well . . . and you, it is rumored, grind lenses far superior to any other artisan in Venice. I have made a special journey from Florence to consult you. Aid me, and you shall never want."

"And if you don't, your reward shall be the same," Lorenzo smiles.

"Pay no attention to him Giovanni. He means no harm."

"How old are you, my lord?" Giovanni humbly asks.

"Why do you ask that?"

"For the reason that the lenses are ground according to your age."

"I understand. Well, I am 74."

"Then you will take a 70 lens. See, I have them graded according to age. All these have been ground by myself . . . those in the other box by my apprentices . . . Now, if you will permit me to adjust this frame to the shape of your eyes and head the fitting will be completed."

Satisfied at last, Giovanni steps back.

"Now, my lord," he says confidently, "you should be able to see much better."

Cosimo dei Medici takes a parchment manuscript from the table and a smile breaks across his shrewd old face.

"Lorenzo," he says joyfully, "I can see this ever so much clearer. It's magical!"

"Thank you," Giovanni says humbly, inwardly thanking his stars that Cosimo's eyes had grown old normally. If they hadn't . . . well, no use thinking about that.

"Before I leave," Cosimo remarks, "I should like to know your secrets."

"Certainly. You see that beam of wood suspended from the ceiling so that it swings in an arc? Well, the lens is fastened to the end, and then the beam is put into motion. The lens is accordingly ground against the iron grinding lap which is nothing more nor less than a pattern."

"You mean the swinging of the beam curves the lens?"

"Exactly. And the length of the beam is determined by the age lens desired." (Had Giovanni but known it he could have described the measurement as follows: The focal length of the lens is equal to the radius divided by 1.5 (index of glass) minus 1, or twice the length of the beam. But that formula wasn't known until sometime after Giovanni's death.)

"And what do you use for grinding purposes?" Cosimo dei Medici asks.

"Sand or Turkish emery."

"I see. Give him a bag of gold, Lorenzo, for the spectacles and the explanation . . . and good-night, Giovanni. I shall recommend your work to all my friends . . . "

And so we take leave of Giovanni and his antiquated method of fashioning and measuring lenses. Sometime later, probably after he was dead, another ingenious artisan thought of reversing the process of grinding. He placed the grinding lap on the end of the beam, thereby obtaining a concave lens, the opposite

of the original curve. These were termed young glasses for young people — known to us as minus lenses.

Toward the latter part of the 16th century another step forward was taken, and again Venice provided the setting. Apparently dissatisfied with the age old method of designating lenses, someone suggested the designation be done according to the effect of the glasses. The equivalent value of the unit set up as compared to our unit was about .6 diopters, but this unit was seldom verified by direct measurement.

Lens makers later adopted the procedure of finding the focal length by determination of the real image of a far distant object.

For negative lenses they frequently used the concave surface as a mirror and in this way determined its radius; more often, however, they used the negative lens in connection with a positive lens, giving a positive combination. This method may have led to the so-called neutralization method.

About 1857 E. Javal of France and a German spectacle works used a scale according to power (reciprocal focal length.) The metric system was suggested in 1866, and records show us it was adopted in 1875 by the leading ophthalmologists of Europe. The first lens measure seems to have been in use about the middle of the 19th century. This instrument gave results in inch numbers, but later was adopted to use the new unit of measure, the diopter.

However, the lens measure will not determine the effective power of ophthalmic lenses. A lens measure determines curvature only. It is really a depth gauge of extremely fine adjustment, and a very close approximation of the effective power of an ophthalmic lens can be obtained, if we have the following data:—

(1) Power of front surface.
(2) Power of rear surface.
(3) Thickness.
(4) Index of refraction. From these the effective power may be computed.

If Alhazen, the Arab, could bridge the gap of nine centuries and see the culmination of his dreams, he would probably bow reverently and whisper: "Allah be praised!"

-- SOPH SOAP

(continued from page ten)

like that, my memory is very poor. However, George Hymoff must have rolled that quaint phrase on his tongue the other afternoon when Al Dorris disgraced himself completely. "Who's the T. L. now?" Words fail me at this point.

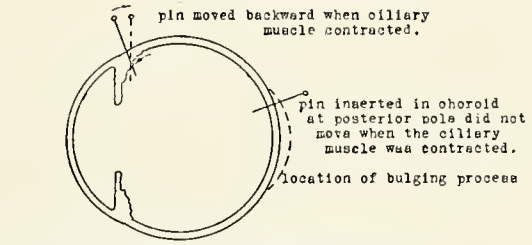
One of the most looked forward to events this year was the occasion when Senor Byrd would open his mouth and bring forth the time-honored and revered statement, "Eet ees too 'ot". But I fear we are doomed to disappointment and drink, for Senor Byrd, not only disregarding heat, but suggesting abysmal cold, is utterly unresponsive. And the reason, — come, come, fellows, must I draw diagrams?

Speaking of diagrams, Miss Elsa Schroder seems to be as pretty as a picture, if I may be allowed. And was that picture *red* when she found herself facing fifty frantic former freshmen finally finding a female during that anatomy period.

Dr. Svendsen was very quietly explaining the many and varied intricacies of the bony orbit to a class utterly absorbed, when suddenly the bell rang. Now usually the ringing of the bell is nothing to get excited about except for those individuals who anxiously await the ending of the hour. But this was different. Although it wasn't the end of the hour, everybody was making noise, and such noise, gales of laughter swept the room and while Dr. Svendsen silently struggled between her senses of duty and of humor, Hindman, the rogue, pulled out of his pocket a new alarm clock purchased during the noon hour. It seemed that just as Hindman got set, so did the alarm clock.

(continued from page five)

sumption was proven invalid by further experiments which demonstrated that the choroid at the posterior pole of the eyeball would not participate in this movement. Yet, it is commonly observed that the stretching process takes place place at the posterior pole. (Figure 6.)


pin moved backward when ciliary muscle contracted.
pin inserted in choroid at posterior pole did not move when the ciliary muscle was contracted.
location of bulging process

The effect on the forward movement of the choroid during the act of accommodation.

Figure 6

(2) CONVERGENCE: Since accommodation failed to account for the production of myopia, attention was called to convergence as the possible causative agent. Convergence has been suggested as a cause of myopia by virtue of the following observations:

1. Two eyes were dissociated so that only monocular vision was had in close work through monocular cycloplegia, and excellent effects were obtained over a period of eight years in controlled cases. (Luedde.)
2. Watchmakers who use a monocular loupe were practically exempt from myopia. (Donder's.)
3. It is claimed that the wearing of base in prisms to eliminate the need for convergence resulted in the checking of the progress of myopia.

(continued in October issue)

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